

Claims

1. A screw alignment device for use with a screw driving tool and a screw during a fastening operation, with said screw being of the type having a shank disposed between a screw head and a distal end, the screw driving tool being of the type having a shaft with a gripping formation at one end thereof and a screw engaging formation at the other end thereof for engagement with the screw head, said screw alignment device including:

a screw guide having a body of generally annular configuration formed from a resilient material and having an internal cavity of generally frusto-conical configuration tapering convergently towards a forward end of the screw guide;

a tool guide spaced rearwardly from the screw guide and aligned generally with an axis of said frusto-conical configuration; and

a connector which connects the screw guide to the tool guide;

where, in use, a screw can be located in the screw guide so as to be aligned generally said axis of said frusto-conical configuration, the distal end of the screw projecting through said forward end and the head of the screw being held by the screw guide, and said tool guide receiving said tool so that when engaged with the screw head said tool, said screw and said tool are releasably held together in substantial alignment, and by driving the screw forwardly into a surface to receive said screw, said head of said screw will cause the screw guide to flex outwardly to permit the screw to pass through the screw guide.

2. A screw alignment device as claimed in claim 1, wherein said screw guide body includes at least one slit therethrough aligned generally parallel with the cone axis.

3. A screw alignment device as claimed in claim 2, wherein said at least one slit is through said screw guide body along a whole length of said screw guide body.

4. A screw alignment device as claimed in claim 2, said at least one slit is through said screw guide body along a partial length of said screw guide body.

5. A screw alignment device as claimed in ~~any one of claims 2 to 4~~ ^{Claim 2}, wherein said slit has one or more of the following functions: said at least one slit is used to allow said screw guide body to flex outwardly as said screw passes therethrough; said at least one slit allows said screw to be inserted into said screw guide.

6. A screw alignment device as claimed in claim 3 wherein said convergent formation is located adjacent said at least one slit to facilitate the entry of a screw into said screw guide.

7. A screw alignment device as claimed in any one of the preceding claims wherein said tool guide comprises a pair of jaws defining a gap therebetween in which the shaft of said tool is located in use.

8. A screw alignment device as claimed in claim 7, wherein said jaws are resiliently able to move apart from each other to increase the width of the gap so as to be able to accommodate a range of shaft diameters.

9. A screw alignment device as claimed in ~~any one of the preceding claims~~ wherein said tool guide is adapted to hold the screw alignment device to the tool.

10. A screw alignment device as claimed in ~~any one of claims 1 to 8~~, wherein said tool guide is adapted to allow the tool to rotate relative to the screw alignment device during a screw driving operation.

11. A screw alignment device as claimed in ~~any one of the preceding claims~~ wherein said tool guide is formed of a resilient material such as sheet metal, plastic, moulded plastic.

12. A screw alignment device as claimed in ~~any one of the preceding claims~~ wherein said connector is an elongate shank having an axis parallel to the cone axis.

13. A screw alignment device as claimed in ~~any one of the preceding claims~~ wherein a screw loading region is defined between the screw guide and the tool guide, for loading screws into the screw guide.

14. A screw alignment device as claimed in ~~any one of the preceding claims~~ wherein said screw guide and the tool guide are formed on the opposite ends of an elongate shank.

15. A screw alignment device as claimed in ~~any one of the preceding claims~~ wherein said tool guide includes formations which assist the tool guide in slidably holding the tool guide to a tool.

16. A screw alignment device as claimed claim 15 wherein said formations include U-shaped formations to wrap partially around the tool.

17. A screw alignment device as claimed in ~~any one of the preceding claims~~ in combination with a cartridge for presenting a plurality of screws in succession to a screw loading region of said screw alignment device, the cartridge including:

a hollow housing having a screw feed channel within the interior of the housing and defining an opening being provided through a wall of the housing into the channel;

moving means to move screws located in the feed channel towards the opening; and

connection means for connecting the cartridge to the screw alignment device,

where in use, the plurality of screws are stored in individual succession on the screw feed channel so that each successive screw is moved towards the opening for insertion into the screw loading region of the screw alignment device in a fastening operation.

- 5 18. A screw alignment device as claimed in claim 17, wherein said moving means includes a biasing means.

a 19. A screw alignment device as claimed in claim 17 ~~or 18~~, wherein said moving means includes a spring.

- a 20. A screw alignment device as claimed in claim 17 ~~or 18~~, wherein said moving means is
10 one or more inclined planes associated with said tool housing, said one or more inclined planes engaging a screw in said hollow housing so that as said plane moves towards said screw said screw is moved towards said opening.

21. A screw alignment device as claimed in claim 20 wherein a second inclined plane acts on a second screw so that as said second inclined plane moves away from said second screw, said
15 second screw will force the first mentioned screw to enter through said opening and be positioned in said alignment device.

22. A screw alignment device as claimed in claim 20 ~~or 21~~, wherein said one or more of said inclined planes are formed on two prongs with a space between said prongs, allowing a shank of said screws to be located in said space.

- a 20 23. A screw alignment device as claimed in ~~any one of claims 17 to 22~~ ^{Claim 17}, wherein one end of said housing is attached to the guide by a locking cap provided with a channel having an axis aligned with the cone axis of the guide when it is located thereon.

24. A screw alignment device as claimed in claim 23 wherein an engaging formation protrudes within the channel in a transverse plane to the axis, for engaging the body of the screw guide.

- a 25 25. A screw alignment device as claimed in ~~any one of claims 17 to 24~~ ^{Claim 17}, wherein said screw carrier means has two oppositely disposed tracks having inner edges that are spaced apart such that the shank of a screw can be located between the tracks and the head of a screw above the tracks.

- a 26. A screw alignment device as claimed in ~~any one of claims 17 to 25~~ ^{Claim 17} wherein a tool passes into said tool guide with said cartridge and or said tool guide being biased to slide relative to said
30 tool.

27. A screw alignment device as claimed in claim 27 wherein said tool is rotatably supported in a tool housing slidably engaging said cartridge.

a 28. A screw alignment device as claimed in ^{Claim 17} ~~any one of claims 17 to 27~~, wherein said cartridge includes means to releasably connect a screw driver to said cartridge and said tool.

a 5 29. A screw alignment device as claimed in ^{Claim 1} ~~any one of the preceding claims~~ wherein said device is adapted to cooperate with a spring means so as to bias said device to a predetermined position when connected to said screw driving tool.

a 30. A screw alignment device as claimed in ^{Claim 1} ~~any one of the preceding claims~~ wherein there is included on said device a platform means to assist the entry of a screw into said screw guide.

a 10 31. A screw alignment guide as claimed in ^{Claim 1} ~~any one of the preceding claims~~ wherein said connector is formed with or as part of a, or the, cartridge for holding a supply of screws for use with said device.

a 32. A screw alignment device as claimed in ^{Claim 1} ~~any one of the preceding claims~~ wherein said screw alignment device includes a screw driving tool slidably held in said tool guide.

a 15 33. A screw alignment device as claimed in ^{Claim 1} ~~any one of the preceding claims~~ wherein said tool guide connector, and said screw guide are located on a cartridge or a housing.

Tool - the tool